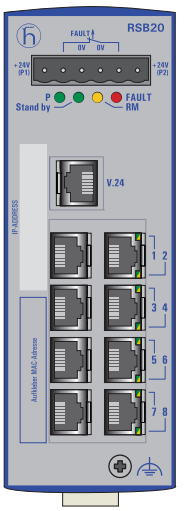
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial ETHERNET Rail Switch Basic
RSB20 Family



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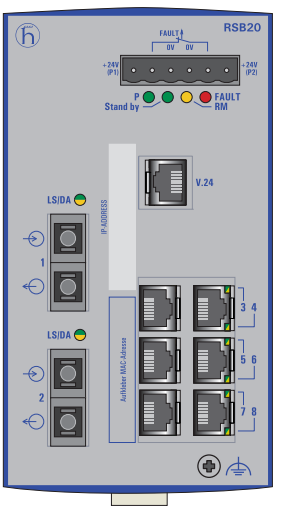

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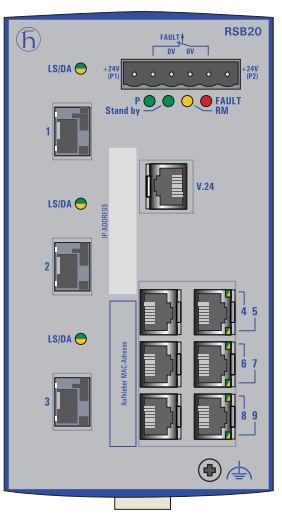

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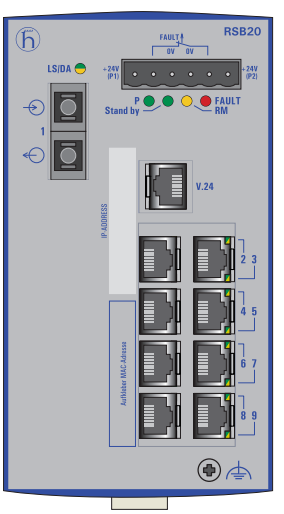

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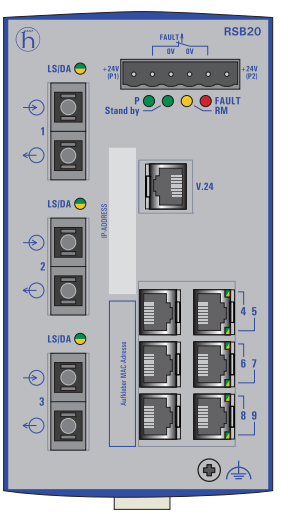

RSB20-0900MMM2

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RSB20
Release 20 09/11

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You can get the latest version of this manual on the Internet at the Hirschmann product site (www.beldensolutions.com).

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Contents

Safety instructions

Important Information

Notice: Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.

This is a general warning symbol. It draws your attention to potential injury risks. Follow all the instructions listed underneath this symbol to avoid injuries or accidents that may result in death.

! DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

Note: Contains important information on the product, on how to manage the product, or on the respective section of the documentation to which your special attention is being drawn.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by the manufacturer. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

⚠ WARNING

ELECTRIC SHOCK
Only connect a supply voltage that corresponds to the type plate of your device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For safety reasons the devices have been designed to operate at low voltages. Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.
The supply voltage is electrically isolated from the housing.

- ☐ Use undamaged parts.
- ☐ Relevant for North America:
  The device may only be connected to a supply voltage of class 2 that fulfills the requirements of the National Electrical Code, Table 11(b). If the voltage is being supplied redundantly (two different voltage sources), the combined supply voltages must fulfill the requirements of the National Electrical Code, Table 11(b).
- ☐ Relevant for North America: For use in Class 2 circuits.
  Only use copper wire/conductors of class 1, 75 °C (167 °F).
- ☐ Relevant for North America
  for devices certified for hazardous locations:
  Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction.
- ☐ The device does not contain any service components. Internal fuses are only triggered if there is a fault in the device. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and return the device to the plant for inspection.

☐ Only switch on the supply voltage to the device if
- the housing is closed,
- the terminal blocks are wired up correctly and
- the terminal blocks are connected.

Shielding ground

Note: The shielding ground of the connectable twisted pair lines is connected to the front panel as a conductor.

☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Housing

⚠ WARNING

ELECTRIC SHOCK

Never insert any pointed objects (small screwdrivers, wires, etc,.) into the product!

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

EQUIPMENT OVERHEATING

When installing the device, make sure any ventilation slots remain free. Maintain a clearance of at least 10 cm (3.94 in).

Failure to follow these instructions can result in injury or equipment damage.

Only technicians authorized by the manufacturer are permitted to open the housing.
The housing is grounded via the separate ground screw on the bottom right of the front panel.

☐ The device must be installed in the vertical position.
☐ The device may only be operated in switch cabinets which comply with the fire enclosure specifications described in EN 60950-1.

Environment

The device may only be operated at the specified surrounding air temperature (temperature of the surrounding air at a distance of up to 5 cm (1.97 in) from the device) and relative air humidity specified in the technical data.

- ☐ Install the device in a location where the climatic threshold values specified in the technical data will be observed.
- ☐ Relevant for North America: MAXIMUM SURROUNDING AIR TEMPERATURE: +60 °C.
- ☐ Use the device only in an environment within the pollution degree specified in the technical data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- ▶ trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- ▶ trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- ▶ trained in providing first aid.

General safety instructions

Electricity is used to operate this equipment. Comply with every detail of the safety requirements specified in the operating instructions regarding the voltages to apply (see page 5).

Non-observance of these safety instructions can therefore cause material damage and/or serious injuries.

- ☐ Only appropriately qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the warnings and maintenance procedures in accordance with this operating manual.
- ☐ The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- ☐ Never start operation with damaged components.
- ☐ Only use the devices in accordance with this manual. In particular, observe all warnings and safety-related information.
- ☐ Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

Note: LED or LASER components in compliance with IEC 60825-1 (2007):

CLASS 1 LASER PRODUCT for Cat. No. having the following fiber optic modules (identified by module code) incorporated: S2, S4, E2, L2, G2, VV, UU, EE, LL, GG.

CLASS 1 LED PRODUCT for Cat. No. having the following fiber optic modules (identified by module code) in corporated: M2, M4, MM, NN.

Refer to the nomenclature for module codes description, see table 1.

National and international safety regulations

☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

CE marking

The devices comply with the regulations contained in the following European directive(s):

2004/108/EG
Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
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Tel.: +49 1805 141538

The product can be used in the industrial sector.

- Interference immunity: EN 61000-6-2:2005
- Emitted interference: EN 55022:2006 + A1:2007 Class A

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

FCC note:

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.
Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.
These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment.
The device creates and uses high frequencies and can radiate same, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

Recycling note

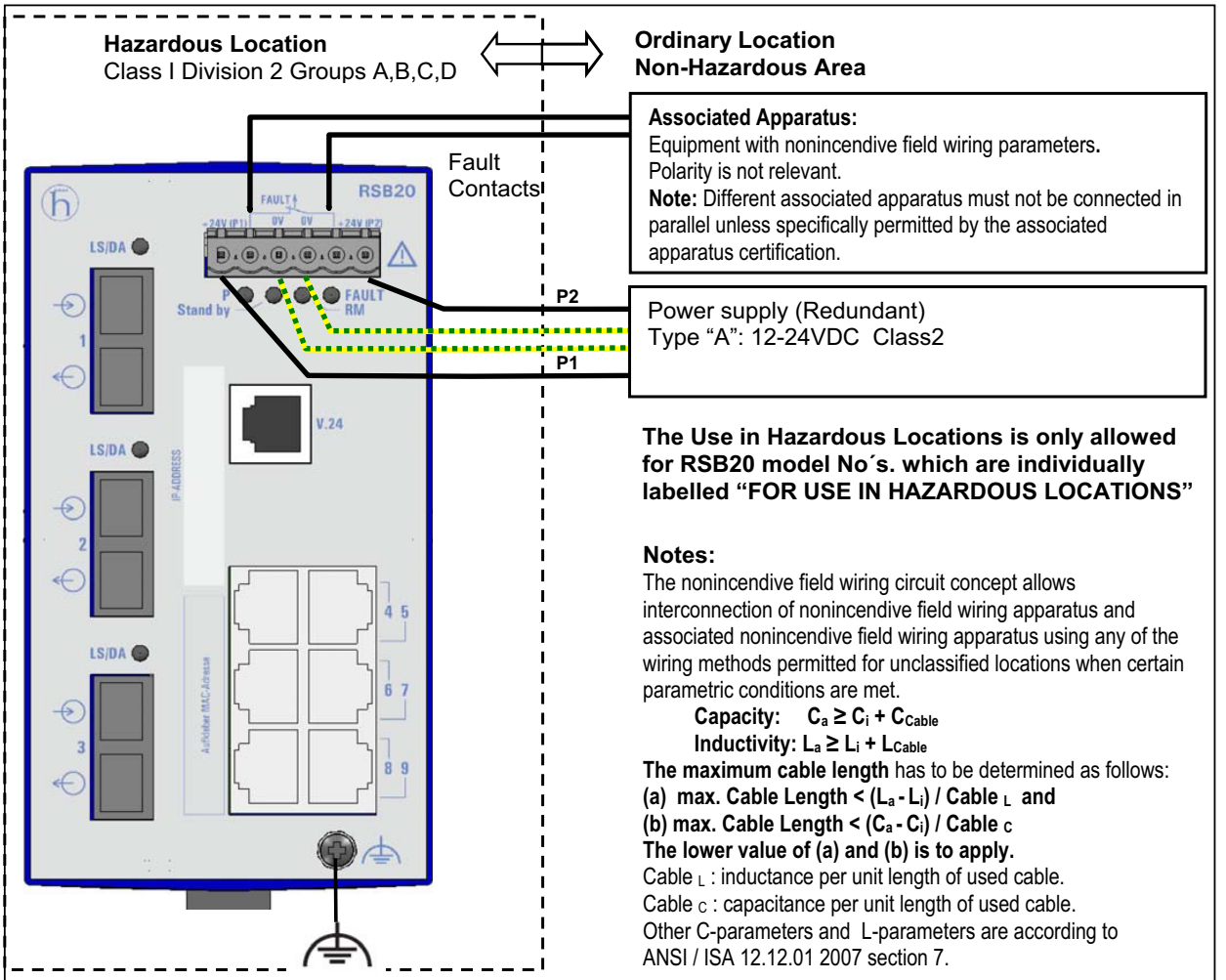
After usage, this product must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state and country.

Maintenance

- ☐ When designing this device, Hirschmann was largely able to forego using wear parts. The parts subject to wear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications (see “Technical data”).
- ☐ Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Depending on the frequency of the switching operations, check the volume resistance of the closed relay contacts and the switching function.
- ☐ Hirschmann are continually working on improving and developing their software. You should regularly check whether there is a new version of the software that provides you with additional benefits. You will find software information and downloads on the product pages of the Hirschmann website.
- ☐ Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

Instructions for Use in Hazardous Locations

Refer to the Control Drawing – Document No. 000147906DNR.



The Use in Hazardous Locations is only allowed for RSB20 model No´s. which are individually labelled "FOR USE IN HAZARDOUS LOCATIONS"

Notes:

The nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus and associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations when certain parametric conditions are met.

Capacity: $C_a \geq C_i + C_{Cable}$

Inductivity: $L_a \geq L_i + L_{Cable}$

The maximum cable length has to be determined as follows:

(a) max. Cable Length < (L_a - L_i) / Cable $_L$ and

(b) max. Cable Length < (C_a - C_i) / Cable $_C$

The lower value of (a) and (b) is to apply.

Cable $_L$: inductance per unit length of used cable.

Cable $_C$: capacitance per unit length of used cable.

Other C-parameters and L-parameters are according to ANSI / ISA 12.12.01 2007 section 7.

Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70 , article 501.

THE RELAY TERMINALS ARE DEPENDENT UPON THE FOLLOWING ENTITY PARAMETERS:	V_{max}	I_{max}	C_i	L_i
	30 V	90 mA	5 pF	0,2 µH

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY .

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOW TO BE FREE OF IGNITABLE CONCENTRATIONS.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

MAXIMUM SURROUNDING AIR TEMPERATURE: 60 °C.

DO NOT OPEN WHEN ENERGIZED.

CONTROL DRAWING for Industrial ETHERNET Rail Basic Switch RSB20 Family according to ANSI / ISA-12.12.01 – 2007		HIRSCHMANN A BELDEN BRAND
Rev.: 1	Document No.: 000147906DNR	Page 1/1

About this Manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.
The following manuals are available as PDF files on the CD-ROM supplied:

- Installation user manual
- Basic Configuration user manual
- Redundancy Configuration user manual
- Web-based Interface reference guide
- Command Line Interface user manual

The Industrial HiVision Network Management Software provides you with additional options for smooth configuration and monitoring:

- Simultaneous configuration of multiple devices
- Graphic interface with network layout
- Auto-topology discovery
- Event log
- Event handling
- Client/server structure
- Browser interface
- ActiveX control for SCADA integration
- SNMP/OPC gateway.

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Device description

The RSB20 devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices allow you to set up switched industrial ETHERNET networks that conform to the IEEE 802.3 and 802.3u standards using copper wires or optical fibers in a line or ring structure.

The devices work without a fan.

The voltage is supplied redundantly.
The devices are mounted very quickly by snapping them onto the DIN rail.

Depending on the device variant, you can choose various media to connect terminal devices and other infrastructure components:
- twisted pair cable
- multimode F/O
- singlemode F/O

The devices feature the Basic software version.

There are a number of convenient options for managing the device.
Administer your devices via:
- a Web browser
- management software (e.g. HiVision)
- a V.24 interface (locally on the Switch)

The HIPER-Ring redundancy concept enables a quick reconfiguration. With one additional connection, projection remains simple.

Product configuration data can be provided by:
- diagnosis displays
- displaying the operating parameters
- a label area for the IP address

The devices provide you with a large range of functions:
- Redundancy functions
  - Redundant ring structure
  - HIPER-Ring
  - Redundant power supply
  - Rapid Spanning Tree Protocol (RSTP)
- Security
  - Protection from unauthorized access
  - Blocking of unauthorized messages (MAC or IP based)
- Synchronized system time in the network
- Network load control
- Operation diagnosis

- Diagnostics (hardware self-testing)
- Reset
- Priority
- Topology Discovery
- Web-based Interface
- Command Line Interface CLI
- SNMP

The Hirschmann network components help you ensure continuous communication across all levels of the company.

1.1 Description of the device variants

The devices differ with regard to the number of interfaces and the media type for connecting segments.

Note: Further information about other differences in the variants of the device can be found in table 7 on page 31.

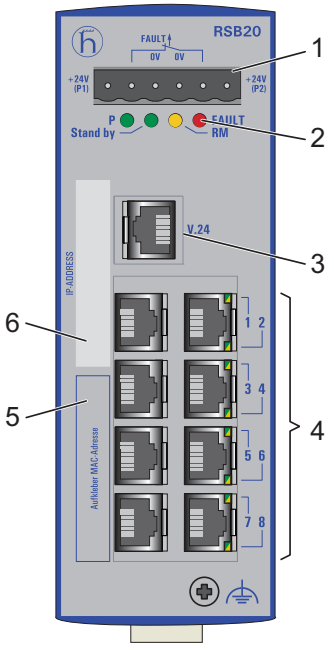
Device variants with 8 or 9 ports are available. The following table shows the number and type of the ports. In the column for the port type, the abbreviations F/O (optical fiber) and TP (twisted pair) indicate the media type, while the abbreviations DSC and RJ45 indicate the socket type. You can plug an SFP transceiver into the SFP slot in order to obtain an optical port.
MM = Multimode, SM = Singlemode.

Variant	10/100 Mbit/s TP ports		100 Mbit/s F/O ports	
	Number	Connection type	Number	Connection type
RSB20-0800T1T1	8	RJ45 socket	—	—
RSB20-0800M2M2	6	RJ45 socket	2	MM, DSC connector
RSB20-0800S2S2	6	RJ45 socket	2	SM, DSC connector
RSB20-0900ZZZ6	6	RJ45 socket	3	SFP slot
RSB20-0900M2TT	8	RJ45 socket	1	MM, DSC connector
RSB20-0900S2TT	8	RJ45 socket	1	SM, DSC connector
RSB20-0900MMM2	6	RJ45 socket	3	MM, DSC connector
RSB20-0900VVM2	6	RJ45 socket	2 1	SM, DSC connector MM, DSC connector

Table 1: Number and type of ports

1.1.1 Device variants with 8 TP ports

Number of ports and media for RSB20-0800T1T1

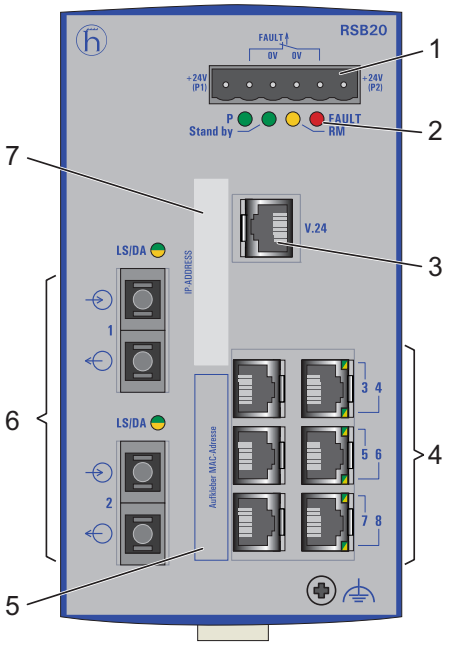


RSB20-0800T1T1...

1	Plug-in terminal block, 6-pin
2	LED display elements
3	V.24 connection for external management
4	8 ports in compliance with 10/100BASE-T(X), RJ45 connections
5	MAC address field
6	IP address field

1.1.2 Device variants with 6 TP ports and 2 FX ports

Number of ports and media for RSB20-0800M2M2 and RSB20-0800S2S2

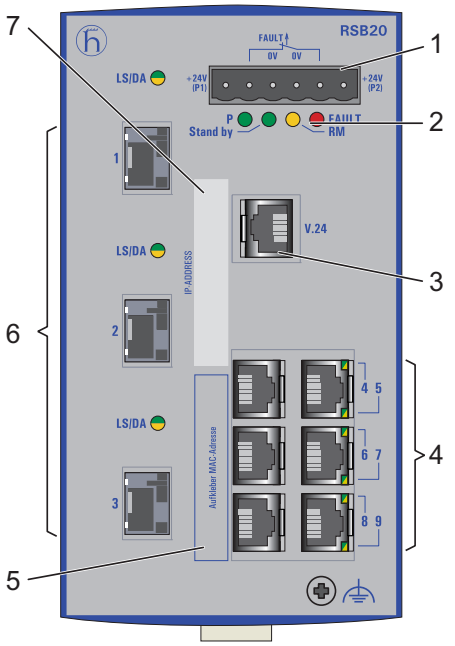


RSB20-0800M2M2

1	Plug-in terminal block, 6-pin
2	LED display elements
3	V.24 connection for external management
4	6 ports in compliance with 10/100BASE-T(X), RJ45 connections
5	MAC address field
6	2 multimode ports in accordance with 100BASE-FX, DSC connections - In RSB20-0800M2M2: Multimode - In RSB20-0800S2S2: Singlemode
7	IP address field

1.1.3 Device variants with 6 TP ports and 3 SFP slots

Number of ports and media for RSB20-0900ZZZ6



RSB20-0900ZZZ6S

1	Plug-in terminal block, 6-pin
2	LED display elements
3	V.24 connection for external management
4	6 ports in compliance with 10/100BASE-T(X), RJ45 connections
5	MAC address field
6	3 SFP slots 100 Mbit/s
7	IP address field

SFP modules

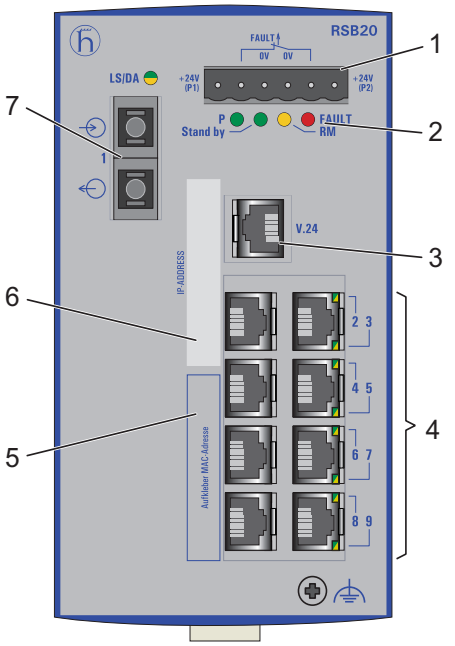
SFP modules are optical transceivers (Fast ETHERNET SFP modules, see page 32 “Accessories”). SFP stands for Small Form-factor Pluggable and is also frequently referred to as mini-GBIC (GigaBit Interface Converter).
The SFP modules are plugged into the SFP slots of the device in order to obtain an F/O port. The device has 3 slots for inserting SFP modules (100 Mbit/s).

For information on expanding the network by using SFP modules, see chapter “Network range” in table 5.

Note: Only use Hirschmann SFP modules (see page 32 “Accessories”).

1.1.4 Device variants with 8 TP ports and 1 FX port

Number of ports and media for RSB20-0900M2TT and RSB20-0900S2TT

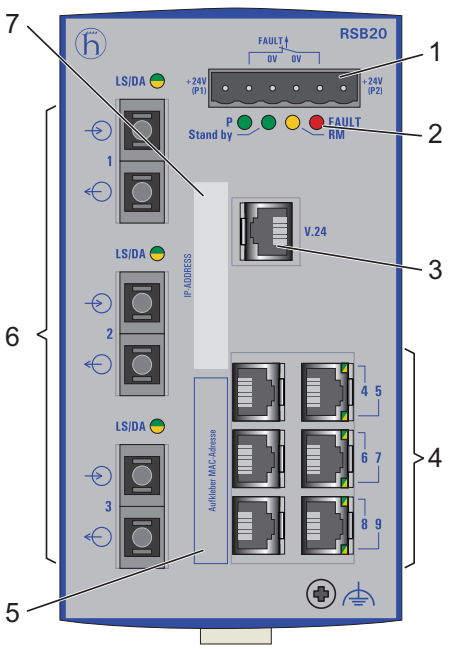


RSB20-0900M2TT

1	Plug-in terminal block, 6-pin
2	LED display elements
3	V.24 connection for external management
4	8 ports in compliance with 10/100BASE-T(X), RJ45 connections
5	MAC address field
6	IP address field
7	One ports in accordance with 100BASE-FX, DSC connection - In RSB20-0900M2TT: Multimode - In RSB20-0900S2TT: Singlemode

1.1.5 Device variants with 6 TP ports and 3 FX ports

Number of ports and media for RSB20-0900MMM2 and RSB20-0900VVM2



RSB20-0900MMM2

1	Plug-in terminal block, 6-pin
2	LED display elements
3	V.24 connection for external management
4	6 ports in compliance with 10/100BASE-T(X), RJ45 connections
5	MAC address field
6	3 multimode ports in accordance with 100BASE-FX, DSC connections - In RSB20-0900MMM2: 3 x Multimode - In RSB20-0900VVM2: 2 x Singlemode and 1 x Multimode
7	IP address field

2 Assembly and start-up

The devices have been developed for practical application in a harsh industrial environment. The installation process is correspondingly simple. On delivery, the device is ready for operation.

The following steps should be performed to install and configure a switch:

- Unpacking and checking
- Insert data in label area
- Connect the terminal block for voltage supply and signal contact and connect the supply voltage
- Install the device on the DIN rail, grounding
- Install the terminal block, start-up procedure
- Connecting the data lines

2.1 Installing the device

⚠ WARNING

ELECTRIC SHOCK

Never insert any pointed objects (small screwdrivers, wires, etc,.) into the product!

Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.1.1 Unpacking and checking

☐ Check that the contents of the package are complete (see page 30 “Scope of delivery”).
☐ Check the individual parts for transport damage.

2.1.2 Installing the SFP modules (optional)

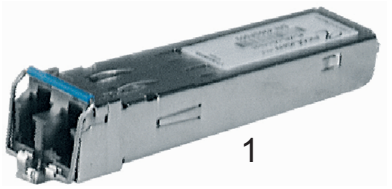


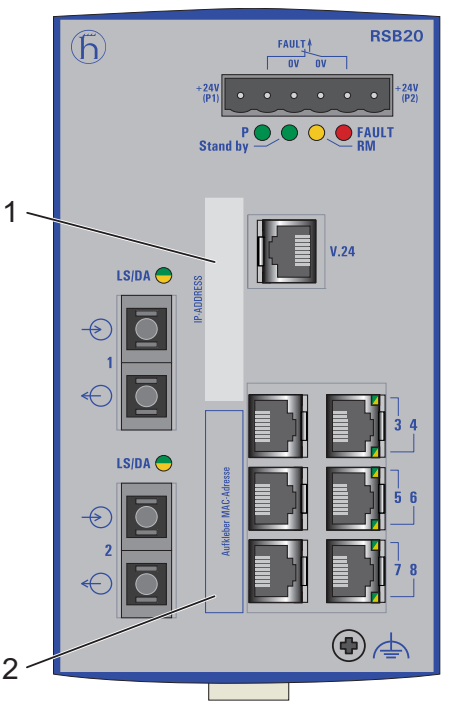
Figure 1: 1 - Fast ETHERNET fiber optic SFP module

☐ Before attaching an SFP module, first remove the protective cap over the socket.
☐ Push the SFP module with the lock closed into the socket until it latches audibly in place.

Note: Only use Hirschmann SFP modules (see page 32 “Accessories”).

2.1.3 Insert data in label area

The information field for the IP address on the front of the device helps you to structure your network installation clearly.

Label area for IP address of device	
	1 IP address of device (label area)
	2 MAC address of device (label)

2.1.4 Connecting the terminal blocks for supply voltage and signal contact

The supply voltage and the signal contact are connected via a 6-pin terminal block with a snap lock.

Supply voltage

WARNING

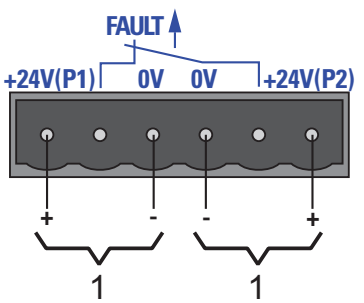
ELECTRIC SHOCK
Only connect a supply voltage that corresponds to the type plate of your device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Note: Observe the following information: page 5 “Supply voltage”.

Redundant power supplies can be used. Both inputs are uncoupled. There is no distributed load. With redundant supply, the power supply unit supplies the device only with the higher output voltage. The supply voltage is electrically isolated from the housing.
See “Insulation voltage” in chapter “General technical data” on page 28.

Connecting the supply voltage at the 6-pin terminal block



1 DC voltage
Nominal voltage range: 12 to 24 V DC
Max. voltage range: min. 9.6 to max. 32 V DC
(Not applicable under UL regulations)

Note: The tightening torque for field wiring terminals is 2 to 4 lb in. (0.22 to 0.25 Nm).

Note: With non-redundant supply of the main voltage, the device reports a loss of power. You can avert this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

“FAULT” signal contact

WARNING

ELECTRIC SHOCK
Observe the electrical threshold values for signal contact (see on page 28 “General technical data”).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- The signal contact (“FAULT”, for pin assignment of terminal block, see fig. 2) monitors the functioning of the device, thus enabling remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the switch Web page to switch the signal contact manually and thus control external devices.

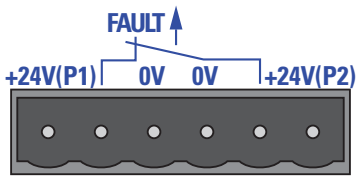


Figure 2: Pin assignment of the signal contact

WARNING
Note the nonincendive field wiring parameters to the Fault contacts according to the Control Drawing – Document No. 000147906DNR – when used in hazardous locations.

A break in contact is used to report the following conditions via the potential-free signal contact (relay contact, closed circuit):

- The detected inoperability of at least one of the two voltage supplies (voltage supply 1 or 2 is below the threshold value).
- The device is not operational.
- The loss of connection at at least one port. The report of the link status can be masked by the Management for each port. In the delivery state, link status monitoring is deactivated.
- The loss of ring redundancy reserve.
- A detected error during the self-test.
- Incorrect configuration of the HIPER-Ring or ring coupling.

The following condition is also reported in RM mode:

- Ring redundancy reserve is available. On delivery, there is no ring redundancy monitoring.

☐ Pull the terminal block off the device and connect the power supply and signal lines.

2.1.5 Installing the device on the DIN rail, grounding

Mounting on the DIN rail

CAUTION

EQUIPMENT OVERHEATING

When installing the device, make sure any ventilation slots remain free. Maintain a clearance of at least 10 cm (3.94 in).

Failure to follow these instructions can result in injury or equipment damage.

- ☐ Mount the device on a 35 mm DIN rail in accordance with DIN EN 60175.
- ☐ Attach the upper snap-in guide of the device into the DIN rail and press it down against the DIN rail until it snaps into place.

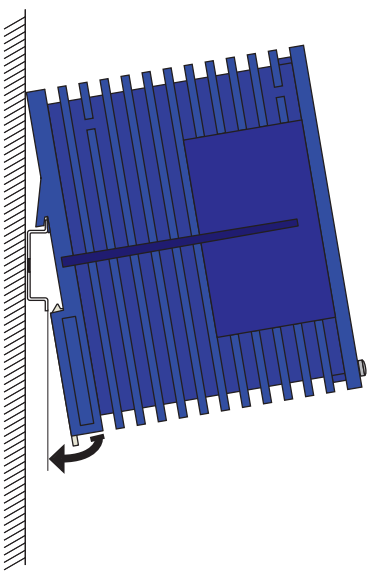


Figure 3: Mounting on the DIN rail

Grounding

The device is grounded by the separate ground screw on the front panel.

2.1.6 Dimension drawings

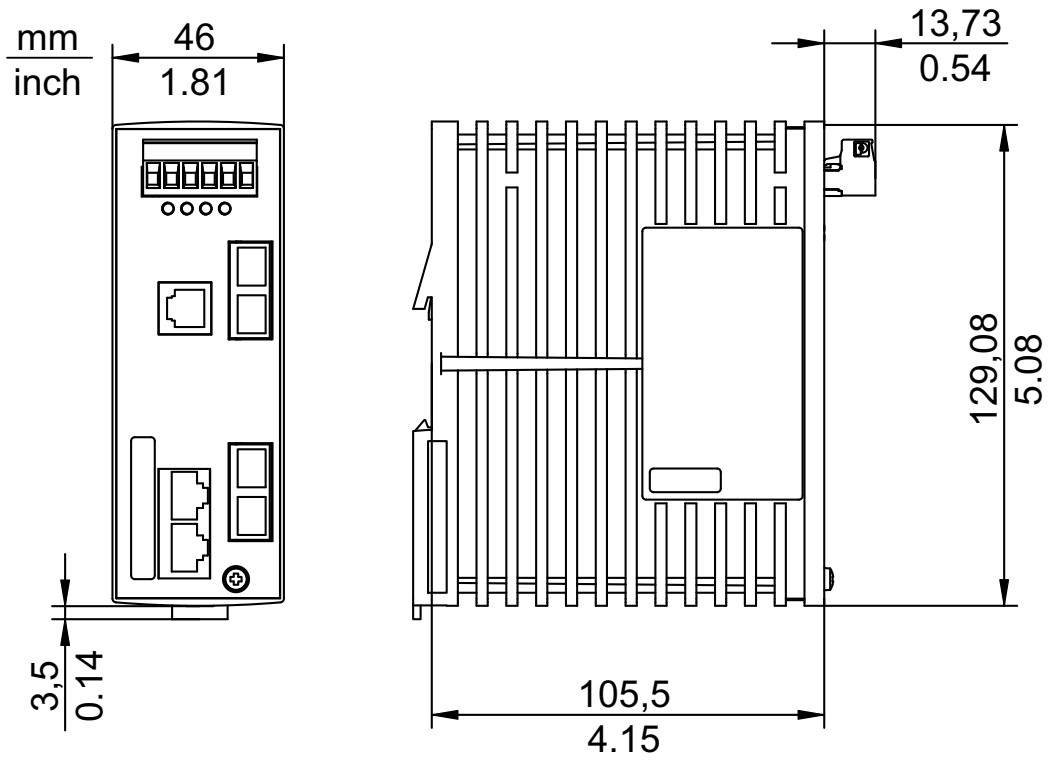


Figure 4: Dimensions of device variants RSB20-0800T1T1

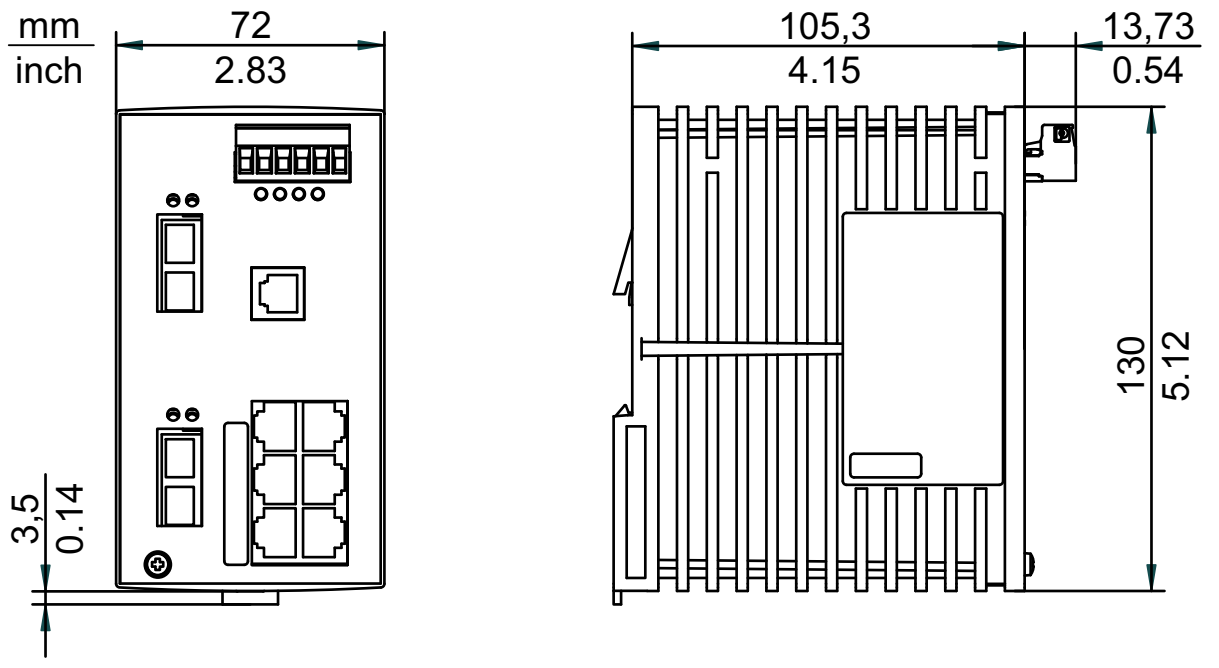


Figure 5: Dimensions of device variants RSB20-0800M2M2, RSB20-0800S2S2 and RSB0900...

2.1.7 Installing the terminal block, start-up procedure

☐ Mount the terminal block for the voltage supply and signal contact on the front of the device using the snap lock. Make sure that the snap lock snaps into place.

Connecting the voltage supply via the terminal block starts the operation of the device.

2.1.8 Connecting the data lines

You can connect terminal devices and other segments at the ports of the device via twisted pair cables or F/O cables.

☐ Install the data lines according to your requirements.

10/100 Mbit/s twisted pair connection

These connections are RJ45 sockets.
10/100 Mbit/s TP ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 10BASE-T/ 100BASE-TX standard.
These ports support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

State on delivery: autonegotiation activated.
The socket housing is electrically connected to the front panel.

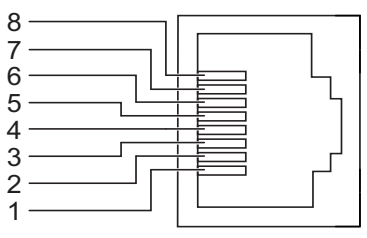
Figure	Pin	Function	
	1	RD+	Receive Data +
	2	RD-	Receive Data -
	3	TD+	Transmit Data +
	6	TD-	Transmit Data -
	4,5,7,8	Not used	

Table 2: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

100 Mbit/s F/O connection

RSB20-0800M2M2, RSB20-0800S2S2, RSB20-0900M2TT, RSB20-0900S2TT, RSB20-0900MMM2, RSB20-0900VVM2:
These connections are DSC connectors.
RSB20-0900ZZZ6
These ports are SFP slots.

100 MBit/s F/O ports enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard.
These ports support:

- Full or half duplex mode

State on delivery: full duplex FDX

Note: Make sure that the LH ports are only connected with LH ports, SM ports are only connected with SM ports, and MM ports only with MM ports.

2.2 Display elements

After the operating voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up. The process takes around 60 seconds.

Device state

These LEDs provide information about conditions which affect the operation of the whole device.

Figure 6: Device status LEDs

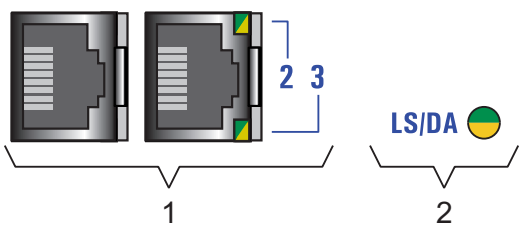
LED	Display	Color	Activity	Meaning
P	Power supply	Green	Lights up	The supply voltages 1 **and** 2 are on.
		Yellow	Lights up	The supply voltages 1 **or** 2 are on.
			None	The supply voltages 1 **and** 2 are too low.

LED	Display	Color	Activity	Meaning
Stand-by	Stand-by mode		None	Stand-by mode not enabled
		Green	Lights up	Standby mode enabled
FAULT	Signal contact		None	Signal contact is closed, it is not reporting an error.
		Red	Lights up	The signal contact is open, it is reporting an error.
				Note: If the manual adjustment is active on the signal contact, then the error display is independent of the setting of the signal contact.
RM	Ring Manager		None	The RM function is deactivated.
		Green	Lights up	The RM function is active. The redundant port is disabled.
			flashing	Incorrect configuration of the HIPER-Ring (e.g. the ring is notconnected to the ring port).
		Yellow	Lights up	The RM function is active. The redundant port is enabled.

Port state

The green and yellow LEDs at the individual port display port-related information. During the boot phase, these LEDs are used to display the status of the boot procedure.

Port status LEDs



1	Port status LEDs for RJ45	
	Upper LED:	Port on the left-hand side, with port number
	Lower LED:	Port on the right-hand side, with port number
2	Port status LEDs for DSC and SFP slot	

LED	Display	Color	Activity	Meaning
LS/DA or port number	Link status	Green	Lights up	Valid connection
			None	No valid connection
			Flashing 1 time a period	Port is switched to stand by
			Flashing 3 times a period	The port is disabled.
	data	Yellow	None	No data traffic
			Flashing	Data traffic

2.3 Basic set-up

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- Configuration via V.24 connection
- Configuration using the HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- Configuration using AutoConfiguration Adapter ACA 11

Further information on the basic settings of the device can be found in the “Basic Configuration” user manual on the CD ROM.

Default settings

- IP address: The device looks for the IP address using DHCP
- Password for management:
  Login: user; password: public (read only)
  Login: admin; password: private (read and write)
- V.24 data rate: 9,600 Baud
- Ethernet ports: link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s, full duplex
  All other ports: autonegotiation
- RM function (Ring Manager) not activated
- RSTP (Rapid Spanning Tree) activated
- HIPER-Ring not activated
- Stand-by mode not enabled

V.24 interface (external management)

The V.24 interface is an RJ11 socket.
At the V.24 connection, a serial interface is provided for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation) or an AutoConfiguration Adapter ACA 11. This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT 100 terminal settings	
Speed	9,600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device.
The V.24 interface is not electrically isolated from the supply voltage.

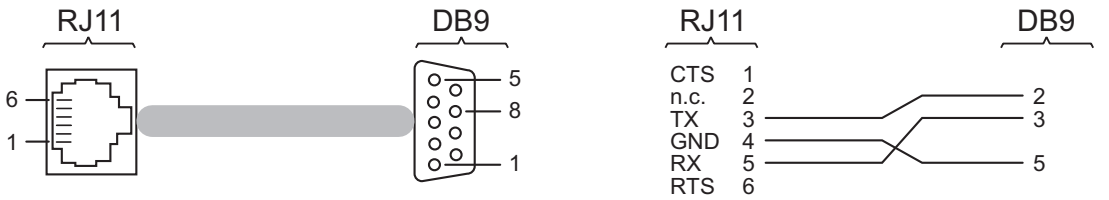


Figure 7: Pin assignment of the V.24 interface and the DB9 connector

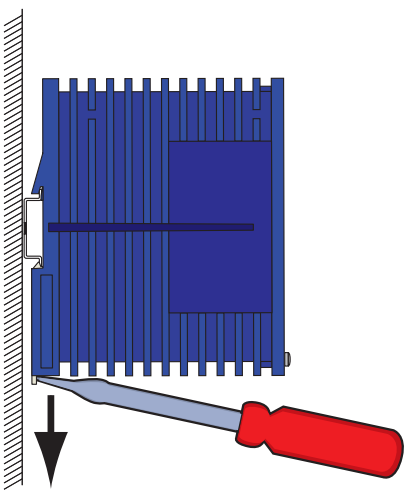
Note: You will find the order number for the terminal cable, which is ordered separately, in the Technical Data chapter (see page 32).

You will find a description of the V.24 interface in the “Basic Configuration User Manual” on the CD-ROM.

2.4 Disassembly

Removing the device from the DIN rail

☐ To take the device off the DIN rail, insert a screwdriver horizontally under the housing into the locking slide, pull it (without tipping the screwdriver) downwards and lift the device upwards.



Disassembling the SFP modules

☐ Pull the module out of the socket by means of the opened lock.
☐ Close the module with the protective cap.

3 Technical data

General technical data

Dimensions W × H × D	RSB20-0800T1T1	47 mm x 131 mm x 111 mm (1.85 in x 5.16 in x 4.37 in)
	RSB20-0800M2M2, RSB20-0800S2S2 and RSB0900...	74 mm x 131 mm x 111 mm (2.91 in x 5.16 in x 4.37 in)
Weight	RSB20-0800T1T1	400 g (0.881 lb)
	RSB20-0800M2M2, RSB20-0800S2S2 and RSB0900...	410 g (0.904 lb)
Power supply	Operating voltage	
	Rated voltage range DC	12 to 24 volts DC, max. 5 A Safety extra-low voltage (SELV), redundant inputs disconnected. Relevant for North America: NEC Class 2 power source max. 5A.
	Max. voltage range DC	min. 9.6 to max. 32 V DC (Not applicable under UL regulations)
Overload current protection at input		Non-replaceable fuse
Insulation voltage between operating voltage connections and housing		800 V DC Protective elements limit the insulation voltage to 45 V DC (1mA)
“FAULT” signal contact	Switching current	max. 0.5 A AC / 0.3 A DC, resistive load
	Switching voltage	max. 60 V DC or max. 30 V AC, SELV
Environment	Storage temperature (ambient air)	Standard: -40 °C to +70 °C (-40 °F to +158 °F) Extended: -40 °C to +85 °C
	Humidity	10% to 95% (non-condensing)
	Air pressure	Up to 2000 m (795 hPa), higher altitudes on request
Surrounding air temperature	Standard	0 °C to +60 °C (+32 °F to +140 °F)
	Extended[a]	-40 °C to +70 °C acc. to UL and CSA: max. +60 °C
Pollution degree		2
Protection classes	Laser protection	Class 1 according to EN 60825-1 (2007)
	Protection class	IP 20

a. If you are using SFP modules without the “EEC” extension, then an operating temperature range from 0 °C to +60 °C applies for your device (see page 32 “Accessories”.)

EMC and immunity

EMC interference immunity		
IEC/EN 61000-4-2	Electrostatic discharge	
	Contact discharge	4 kV
	Air discharge	8 kV
IEC/EN 61000-4-3	Electromagnetic field	
	80 - 3,000 MHz	10 V/m
IEC/EN 61000-4-4	Fast transients (burst)	
	Power line	2 kV
	Data line	1 kV
IEC/EN 61000-4-5	Voltage surges	
	Power line, line / line	0.5 kV
	Power line, line / earth	1 kV
	Data line	1 kV
IEC/EN 61000-4-6	Line-conducted interference voltages	
	150 kHz - 80 MHz	10 V
EMC emitted interference		
EN 55022	Class A	Yes
FCC 47 CFR Part 15	Class A	Yes
Stability		
Vibration	IEC 60068-2-6 Test FC test level according to IEC 61131-2	Yes
Shock	IEC 60068-2-27 Test Ea test level according to IEC 61131-2	Yes

Network range

TP port	
Length of a twisted pair segment	typ. 100 m (cat5e cable with 100BASE-TX)

Table 3: TP port 10BASE-T / 100BASE-TX

Product code		Wave length	Fiber	System attenuation	Expansion	Fiber data
-M2, -MM	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
-M2, -MM	MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
-S2, -VV	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)

Table 4: F/O port 100BASE-FX

Product code M-FAST-SFP-...		Wave length	Fiber	System attenuation	Extent[a]	Fiber data
-MM/LC...	MM	1310 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
-MM/LC...	MM	1310 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
-SM/LC...	SM	1310 nm	9/125 µm	0-13 dB	0-25 km	0.4 dB/km; 3.5 ps/(nm*km)
-SM+/LC...	SM	1310 nm	9/125 µm	10-29 dB	25-65 km	0.4 dB/km; 3.5 ps/(nm*km)
-LH/LC	SM	1550 nm	9/125 µm	10-29 dB	47-104 km	0.25 dB/km; 19 ps/(nm*km)
-LH/LC	SM	1550 nm	9/125 µm	10-29 dB	55-140 km	0.18 dB/km; 18 ps/(nm*km)[b]

Table 5: Fiber port 100BASE-FX (SFP fiber optic Fast ETHERNET Transceiver)

a. including 3 dB system reserve when compliance with the fiber data is observed
b. with ultra-low-loss optical fiber

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

Power consumption/power output

Device name	TX ports	FX ports	Maximum power consumption	Maximum power output
RSB20-0800T1T1	8 x RJ45	— —	6.0 W	20.5 Btu (IT)/h
RSB20-0800M2M2	6 x RJ45	2 x MM, DSC	8.0 W	27.5 Btu (IT)/h
RSB20-0800S2S2	6 x RJ45	2 x SM, DSC	8.0 W	27.5 Btu (IT)/h
RSB20-0900ZZZ6	6 x RJ45	3 x SFP	9.0 W	31.0 Btu (IT)/h
RSB20-0900M2TT	8 x RJ45	1 x MM, DSC	8.0 W	27.5 Btu (IT)/h
RSB20-0900S2TT	8 x RJ45	1 x SM, DSC	8.0 W	27.5 Btu (IT)/h
RSB20-0900MMM2	6 x RJ45	3 x MM, DSC	9.0 W	31.0 Btu (IT)/h
RSB20-0900VVM2	6 x RJ45	2 x SM, DSC 1 x MM, DSC	9.0 W	31.0 Btu (IT)/h

Table 6: Power consumption/power output RSB20 devices

Scope of delivery

Device	Scope of delivery
RSB20-...	Device
	Terminal block for supply voltage and signal contact
	Installation user manual and CD-ROM

Product designations, important product characteristics, order numbers

Designation	TX ports	FX ports	Operating temperature	Preconfiguration	Order number
RSB20-0800T1T1	8 x RJ45	— —	0 °C to +60 °C	None	942 014-001
RSB20-0800T1T1	8 x RJ45	— —	0 °C to +60 °C	EtherNet/IP	942 014-017
RSB20-0800M2M2	6 x RJ45	2 x MM, DSC	0 °C to +60 °C	None	942 014-002
RSB20-0800M2M2	6 x RJ45	2 x MM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-018
RSB20-0800S2S2	6 x RJ45	2 x SM, DSC	0 °C to +60 °C	None	942 014-003
RSB20-0800S2S2	6 x RJ45	2 x SM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-019
RSB20-0900ZZZ6	6 x RJ45	3 x SFP	0 °C to +60 °C	None	942 014-004
RSB20-0900ZZZ6	6 x RJ45	3 x SFP	0 °C to +60 °C	EtherNet/IP	942 014-020
RSB20-0900M2TT	8 x RJ45	1 x MM, DSC	0 °C to +60 °C	None	942 014-005
RSB20-0900M2TT	8 x RJ45	1 x MM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-021
RSB20-0900S2TT	8 x RJ45	1 x SM, DSC	0 °C to +60 °C	None	942 014-006
RSB20-0900S2TT	8 x RJ45	1 x SM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-022
RSB20-0900MMM2	6 x RJ45	3 x MM, DSC	0 °C to +60 °C	None	942 014-007
RSB20-0900MMM2	6 x RJ45	3 x MM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-023
RSB20-0900VVM2	6 x RJ45	2 x SM, DSC 1 x MM, DSC	0 °C to +60 °C	None	942 014-008
RSB20-0900VVM2	6 x RJ45	2 x SM, DSC 1 x MM, DSC	0 °C to +60 °C	EtherNet/IP	942 014-024
RSB20-0800T1T1	8 x RJ45	— —	-40 °C to +70 °C	None	942 014-009
RSB20-0800T1T1	8 x RJ45	— —	-40 °C to +70 °C	EtherNet/IP	942 014-025
RSB20-0800M2M2	6 x RJ45	2 x MM, DSC	-40 °C to +70 °C	None	942 014-010
RSB20-0800M2M2	6 x RJ45	2 x MM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-026
RSB20-0800S2S2	6 x RJ45	2 x SM, DSC	-40 °C to +70 °C	None	942 014-011
RSB20-0800S2S2	6 x RJ45	2 x SM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-027
RSB20-0900ZZZ6	6 x RJ45	3 x SFP	-40 °C to +70 °C	None	942 014-012
RSB20-0900ZZZ6	6 x RJ45	3 x SFP	-40 °C to +70 °C	EtherNet/IP	942 014-028
RSB20-0900M2TT	8 x RJ45	1 x MM, DSC	-40 °C to +70 °C	None	942 014-013
RSB20-0900M2TT	8 x RJ45	1 x MM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-029
RSB20-0900S2TT	8 x RJ45	1 x SM, DSC	-40 °C to +70 °C	None	942 014-014
RSB20-0900S2TT	8 x RJ45	1 x SM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-030
RSB20-0900MMM2	6 x RJ45	3 x MM, DSC	-40 °C to +70 °C	None	942 014-015
RSB20-0900MMM2	6 x RJ45	3 x MM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-031
RSB20-0900VVM2	6 x RJ45	2 x SM, DSC 1 x MM, DSC	-40 °C to +70 °C	None	942 014-016
RSB20-0900VVM2	6 x RJ45	2 x SM, DSC 1 x MM, DSC	-40 °C to +70 °C	EtherNet/IP	942 014-032

Table 7: Product designations, important product characteristics, order numbers

Note: Observe all other information on the operating temperatures (see page 28 “General technical data”).

Accessories

Fast-Ethernet SFP transceiver	Order number
M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001

Other accessories	Order number
6-pin terminal block (50 pcs.)	943 845-006
AutoConfiguration Adapter ACA 11	943 751-001
HiVision Network Management software	943 471-100
OPC Server software HiOPC	943 055-001
Pocket Guide	280 710-851
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Terminal cable	943 301-001

Underlying norms and standards

Name	
cUL 508:1998	Safety for Industrial Control Equipment
EN 55022:2006 + A1:2007	IT equipment – radio interference characteristics
EN 61000-6-2:2005	Generic norm – immunity in industrial environments
EN 61131-2:2007	Programmable logic controllers
FCC 47 CFR Part 15:2009	Code of Federal Regulations
EN 60950-1:2006 + A11:2009 + A1:2010	Safety for the installation of IT equipment
IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.3-2002	Ethernet
ISA 12.12.01, CSA C22.2 no. 213	Electrical Equipment for Use in Class I and Class II, Div.2 and Class III Hazardous (Classified) Locations

Table 8: List of norms and standards

The device has a certification based on a specific standard only if the certification indicator appears on the housing.
However, with the exception of Germanischer Lloyd, ship certifications are only included in the product information under www.beldensolutions.com.

A Further Support

Technical Questions and Training Courses

In the event of technical queries, please contact your local Hirschmann distributor or Hirschmann office.
You can find the addresses of our distributors on the Internet:
www.beldensolutions.com.

Our support line is also at your disposal:

- Tel. +49 1805 14-1538
- Fax +49 7127 14-1551

Answers to Frequently Asked Questions can be found on the Hirschmann internet site (www.beldensolutions.com) at the end of the product sites in the FAQ category.
The current training courses to technology and products can be found under http://www.hicomcenter.com.

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